



KAIZEN BLITZ PILOT

Report Two

Prepared for:
Energy Trust of Oregon



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MEMO

Date: April 20, 2012
To: Board of Directors
From: Philipp Degens, Evaluation Manager
Kim Crossman , Sr. Industrial Sector Manager
Subject: Staff Response to the Process Evaluation of the Kaizen Blitz Year 2 Report

The Kaizen Blitz (KB) Pilot resulted in highly satisfied customers who continue to maintain O&M processes that will allow energy savings to persist over time. These results provide additional support to the decision to add these services to the regular Production Efficiency (PE) program offerings.

Many of the successful elements utilized in the KB Pilot are being adopted in other Energy Trust program offerings, such as the PE program's Refrigerator Operators Coaching and the Existing Buildings program's Building Performance Tracking and Control Systems Pilot.

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Introduction

Energy Trust of Oregon (Energy Trust) is operating a program within its Production Efficiency (PE) Program to implement a Kaizen Blitz initiative with select Energy Trust customers (Kaizen Blitz). The Kaizen Blitz is being implemented by Cascade Energy Engineering (Cascade) under Energy Trust oversight. The Kaizen Blitz initially targeted four to five sites in the warehouse or food processing industries with substantially sized refrigeration systems. Four customers ultimately participated (Cohort 1). A second cohort (Cohort 2) of five customers began in December of 2009.

The program process consists of an initial on-site tune up followed by technical support provided for a year. During the initial on-site tune up, Cascade works intensively with the participant, on site, for up to a week to identify low or no-cost opportunities to reduce facility energy use through improvements made to the refrigeration, lighting, door, HVAC, and battery systems. Where possible, the recommendations are implemented on the spot. A final report (Final Report or Action Items Report) is prepared documenting the energy savings opportunities into an action plan for the following year. The report also identifies capital upgrade projects with good potential for producing an attractive return on investment.

Follow-up engineering support is provided periodically for a year to track the action items identified in the Action Items Report but also to support the participants in developing a tracking system to monitor energy use performance. The objective is that through a combination of tools and coaching, the facilities can become somewhat self-sufficient at tracking energy. Approximately a year after the Action Items Report is delivered, a final inspection is conducted and a report prepared to document the measures that were ultimately implemented and the resulting energy savings (Inspection Report).

When the Kaizen Blitz was first introduced, Energy Trust paid 75 percent of the cost of the technical support provided by Cascade and the customer was required to pay their portion (25 percent) before work commenced. Beginning with cohort three, the customer copayment will be eliminated and Energy Trust will pay for 100 percent of the technical support. Energy Trust provides an incentive equal to 50 percent of the eligible costs of the action items documented in the Final Report. The participant's

internal labor used to implement the action items is eligible for reimbursement. An enrollment agreement between Energy Trust and the customer documents the incentive and the customer’s obligations and must be executed prior to the on-site tune-up. The participants receive an incentive calculated based on the energy savings realized by the action items identified in the reports.

The customer’s obligations are to:

- Support the installation of meter monitoring equipment;
- Allow access to energy and production data;
- Allow facility access;
- Identify an energy champion;
- Authorize other personnel involvement throughout the project period;
- Pay their portion of the funding for the technical support; and
- Implement the action items identified in the Action Items Report.

The Kaizen Blitz is conducted as soon a possible after the agreement between Energy Trust and the customer is signed. The Final Report documents the findings of the Kaizen Blitz in a twelve month action plan. The Final Report is usually delivered within four weeks of the Kaizen Blitz.

Table 1 lists the Kaizen Pilot participants for Cohorts 1 and 2, along with the key dates of the Kaizen Blitz process. Dates in *italics* are targeted dates.

Table 1: Kaizen Blitz Participants

	Part ID	Facility Type	Kaizen Blitz Conducted	Final/Action Plan Report Date	Inspection Report Date
Cohort 1	2353	Distribution Center	May 5 - 9, 2008	June 12, 2008	September 11, 2009
	2366	Dairy	June 3 – 6, 2008	July 29, 2008 Rev. August 8, 2008	March 9, 2009
	2482	Distribution Center	September 29 - October 2, 2008	January 5, 2009	March 17, 2010
	1845	Frozen Foods Processing	June - August, 2008	Rev. Nov. 1, 2008	December 18, 2009
Cohort 2	2925	Dairy	December 7 – 9, 2009	February 11, 2010	December 13, 2010
	2866	Frozen Foods Processing	Sept. 22-23, Oct. 27 and Nov. 17, 2009	April 21, 2010	January 4, 2011

			March 31, 2010		
2926	Distribution Center		January 11 - 13, 2010	February 15, 2010 Rev. March 31, 2010	September 15, 2010
2725	Canning and Processing		May 3-6, 2010	June 20, 2010	September 30, 2010
3173	Bakery		October 12-14, 2010	December 9, 2010	<i>April 15, 2012</i>
3174	Dairy		December 7-9, 2010	January 12, 2011	<i>May 15, 2012</i>

Evaluation Objectives and Approach

Evaluation Objectives

The main evaluation objectives for the Kaizen Blitz were to answer the following questions:

- What motivates customers to improve their efficiency and to maintain a higher level of efficient operation over time?
- Are the incentive levels adequate, low, or high? What were the keys to success? If a customer did not perform, why not?
- Did Energy Management software and support add value to the Kaizen Blitz process? Does it help track and maintain savings? Does the customer see the value? Does it help project and program evaluation?
- Are the savings levels sufficient to carry the added cost of services? Do the savings persist?
- Are there improvements to customer/program relationships through collaborative implementation of operational changes?

Evaluation Approach

To accomplish the evaluation objectives, Navigant Consulting conducted a review of the Kaizen Blitz materials, interviews with the Kaizen Blitz program management, and interviews with participants conducted February through July of 2010. The results of these evaluation activities are documented in a report available on the Energy Trust Web site.

This report documents the findings from a second round of interviews conducted with participants between March and May of 2011. Participants of cohort 1 were interviewed for a second time, as a follow up to their first interview to understand retention practices and determine whether any new action items were implemented. This was the first interview for the participants of cohort 2. For them, the objectives were to:

- Solicit feedback on the services received during the Kaizen Blitz.
- Determine the applicability of the information and services received during the Kaizen Blitz.

- Seek an assessment of the mentoring received by Cascade.
- Determine the outcomes of the recommendations and services.
- Find out the challenges the participants have encountered in achieving the goals.
- Document the participant’s anticipated near-term and long-term project induced actions.
- Conduct an assessment of the pilot’s strengths and weaknesses.
- Obtain recommendations for changes or augmentation to the pilot.

Table 2 indicates the date of each participant’s first interview and second, if applicable. Multiple interview dates indicate that two individuals from the participant firm were interviewed on *separate occasions*. One participant from cohort 1 refused a second interview, stating that too much time had passed since their participation. One participant from cohort 2 did not respond to requests for an interview.

Table 2. Participant Interviews for Reports 1 and 2

	Participant ID	Report 1 Evaluation Interview Date	Report 2 Evaluation Interview Date
Cohort 1	2353	February 18, 2010	May 9, 2011
	2366	February 19, 2010	May 27, 2011
	2482	June 10, 2010 June 14, 2010	April 18, 2011
	1845	February 17, 2010	N/A
Cohort 2	2925	May 3, 2010	April 18, 2011
	2866	June 9, 2010 July 21, 2010	March 10, 2011
	2926	May 5, 2010	N/A
	2725	N/A	March 28, 2011
	3173	N/A	May 11, 2011
	3174	N/A	May 9, 2011

Prior to commencing each interview attempt, Cascade sent an e-mail to the participants notifying them that a member of the Navigant Consulting team would be contacting



them for a brief interview. This provided an introduction for the Navigant Consulting interviewer which greatly facilitated the scheduling process.

Participant Interview Findings

This section summarizes the findings from participant interviews for each of the key research areas. Eight interviews were conducted in total; three participants were interviewed just after receiving their Final Report, and five participants were interviewed one year after the Kaizen Blitz. Key conclusions and recommendations from Navigant Consulting are in the next section, “Conclusions and Recommendations”.

Motivation to Participate

Energy and cost savings were identified as the major motivating factors for participating in the Kaizen Blitz. Having an outside opinion and a better understanding of facility operations were also seen as highly valued benefits of participating.

When asked whether the incentive or the energy savings was a bigger motivator, participants were split, with one half of the participants responding energy savings and the other half responding “both.” One participant said that although energy savings was a bigger motivator, the incentive made their involvement possible.

“The ultimate goal of savings was the bigger motivator, but the incentive brought payback down to one year. We don’t do anything over a year.”

Another participant said that energy savings was the biggest motivator due to the company’s commitment to reducing its carbon footprint.

Four participants commented on the benefits of receiving advice from someone outside of their facility. Having “outside eyes” and an “outside opinion” was seen as very valuable.

“When you are dealing with it every day, an outside perspective can give you great visibility.”

Reaction to Savings Report

Participants who were interviewed just after receiving their Final Reports were asked to comment on the savings opportunities suggested. Some participants were surprised

by the amount of energy consumed by certain end uses. One participant in particular was surprised by a pie chart of energy use which was included in the report.

“We weren’t surprised that refrigeration was big but it was an eye opener that compressed air was such a big piece.”

Another participant was surprised by how much energy was consumed by some of the smaller end uses of the facility.

“Surprised at... heaters and other things that add up in a hurry. Things we can do better next winter.”

A third participant said that he was not surprised by the amount of efficiency opportunities, commenting:

“This plant was built in 1964 so [I figured] there were lots of opportunities.”

Implementing Action Items

Participants interviewed one year after the Kaizen Blitz were able to implement the vast majority (80 to 100 percent) of their action items within the given time frame. Two of the participants were able to implement all of their action items but one, and one of these participants was able to reach this goal within 90 days. The three participants interviewed after they received their Action Items Report were confident that they could implement all or most of their action items within the given time.

A few participants indicated that they still planned on implementing outstanding action items, but that they were waiting to find the time. In other cases, an action item was not implemented for a variety of factors:

- Certain action item areas were “hands off” because of laws, safety, or best practices.
- An operator was skeptical of a given change and felt that he was already performing optimally.
- Some savings opportunities did not apply to one participant because he didn’t control some of the building’s large central systems.

Only in a couple of cases were participants hesitant to implement an action item suggested by Cascade. In one case, Cascade suggested to enclose the evaporator unit

of a cold storage room in order to capture heat from defrost, making it faster and more efficient. The participant said that only a couple of companies had attempted to automate this procedure, so his facility was hesitant to risk the implementation. In another case Cascade suggested a temperature increase for a freezer, but the participant was concerned about what may happen to some of the freezer's contents, mainly ice cream.

Time and labor constraints were the most common barriers encountered while attempting to implement various action items. Two participants commented on difficulties finding internal resources to put towards the action items, especially when business was booming.

"When the facility gets busy, it's good for business, but... EE gets pushed aside because you are making money."

"Production comes first, so always a task to free up resources internally."

Another participant commented on the difficulty of freeing up internal staff, especially when one action item required considerable support.

"As you repair leaks, you increase capacity, so you had to recalibrate the system. It was viewed as a problem at first because we had to bring in outside plumbers to adjust the system... Hopefully, we will be able to maintain ourselves. Staff time is always limited and you can't really keep up with the new leaks."

A few participants mentioned issues they encountered with staying organized during the Kaizen Blitz, including:

- Keeping track of paperwork and cost records;
- Separating Kaizen Blitz hours from regular maintenance, which could be difficult; and
- Staying organized internally – issuing projects with different mechanics and not overwhelming staff.

Kaizen Blitz Process

Most participants reported that the most valuable services they received during the Kaizen Blitz were the energy survey performed by Cascade and the knowledge and experience that was shared by Cascade.

Participants interviewed at the one year mark commented that the Kaizen Blitz required anywhere from 10 to 30 percent of their time. Responses varied based on the amount and complexity of action items each participant had to implement.

One participant said that the Kaizen Blitz took 40 hours per month of his time, while another participant said “20 to 30 hours per month with several folks.” Other participants reported the total time spent on the project. One participant said 100 total hours spent on the Kaizen Blitz, and another responded several hundred hours from management over 6 months and labor from hourly people. A participant with “easier action items” said that the project “did not take a lot of time.”

All participants said that the given time frame was reasonable to complete action items. One participant commented that the incentive motivated them to implement items faster, and some participants were able to implement most of their action items within three to six months.

Energy Management Software

Cohort 2 participants were set up with an energy management software tool as part of the Kaizen Blitz program. All of these participants said that the energy management software has been a useful tool for tracking energy use and savings, and all but one said that they have had a chance to use the tool personally.

The majority of participants said that the system was easy to set up, with one participant commenting that setup was “very easy.” One participant said that the software setup was fairly easy, but the hardest part was getting the meters to work consistently. He noted that three of his meters have worked well, but he continues to struggle with one.

The level and frequency of use of the energy management software varied considerably across participants. Participants responded using the tool monthly, weekly, and bi-weekly. One participant noted that every department in his facility used the software, and each month, operators get to see their actual energy use. He said that although he uses the software twice a week, he knows that another department uses it on a sub-hourly basis, closely watching increases in kWh. This feedback is then used to decide when to run production lines and how many to run.

Two participants mentioned using the energy consumption data in conjunction with production data. One participant said that he overlays energy consumption with

production so that he can identify areas to modify production and reduce peak. Another participant said that he likes to visualize energy in terms of units produced.

Three participants indicated features they would like to see in the energy management tool or features they have asked Cascade to implement, including:

- Enhancing the system to break out end uses more finely;
- Providing a way to understand the impact of newly added equipment or process changes; and
- Changing reporting intervals from minutely to weekly or daily.

Two participants indicated that Cascade has already implemented changes to the energy management tool for them, and that their responses have been “quick.” One participant commented on this matter, saying:

“Every time we have suggestions, they get taken care of right away. We just call [Cascade] and ask, and they do it in the next couple of days.”

All participants responded that they plan to continue using the energy management software tool into the future, although one participant was concerned about his company’s follow-through using the tool long term.

Persistence of Savings

Participants who have completed the Kaizen Blitz unanimously responded that they are maintaining the changes made during the process. Participants identified a list of factors that have motivated them to sustain the energy savings over the long term.

They include:

- A company-wide commitment to sustainability;
- “It’s the right thing to do”;
- Staying competitive – “Reducing operation costs makes us more competitive”;
- Less wear and tear on equipment;
- Cost reduction and streamlining of energy costs; and
- Praise from management.

Although all participants said that they planned on sustaining energy savings over the long term, a couple voiced concerns about falling back into old habits. Two

participants commented that they have implemented new procedures to ensure energy savings are sustained, including:

- Making it easier for employees to turn off unused equipment, and where possible, automating equipment to turn off when not in use;
- Incorporating practices learned from the Kaizen Blitz into daily routines and maintenance procedures; and
- Ensuring that all departments understand and support the practices implemented.

Improvements to Customer Relationships

The Kaizen Blitz was considered a success by all participants interviewed. Many participants measured their success in terms of the cost and energy savings achieved from the program.

“Yes, [it was a success]. Not just the dollar but the kWh.”

“Yes. 20 percent energy savings.”

“We see the energy savings and continue to see them compared to where we were last year.”

When asked if there was any additional support that the Energy Trust could have provided for the Kaizen Blitz, the majority of participants responded “no”. One participant indicated that he would like help educating staff. Unrelated to the Kaizen Blitz, another participant commented that he would be interested in becoming more involved with members of his industry and other industries to find out what energy efficiency opportunities they are pursuing and what hurdles they have overcome. He wondered if the Energy Trust could organize such a forum.

All participants seemed very satisfied with the support they received from Cascade throughout the process. Several participants pointed to the deep expertise and knowledge of Cascade; one participant commented that he was “impressed” with Cascade’s engineer. Other participants were happy with how quick Cascade was to address any issues they were having.

Future Project Opportunities

After being a part of the Kaizen Blitz program, all participants responded that they were more likely to work with the Energy Trust on other initiatives in the future, including capital projects.

Two participants mentioned that they are already working with the Energy Trust of Oregon on capital projects – one on an LED lighting project, and the other on lighting and gas projects. Exterior lighting, primarily LED, was identified as the most popular capital project of interest. Other capital projects being considered by participants included:

- HVAC controls;
- Compressed air projects, including control schemes;
- Main transformer replacement; and
- Boiler projects.

Advice for Future Participants

Participants were asked what recommendations or advice they would give to other firms considering participation in the Kaizen Blitz.

Some participants suggested keeping an open mind about the process and the recommendations from Cascade.

“It’s better just to jump into it cold rather than a mindset that you already know what they’re going to do.”

“One of the key things is to explore all your options to take advantage of the resources out there.”

Other participants suggested being prepared and staying organized, as well as making sure everyone is on board.

“It’s just collecting the data. Going back 3-4 years and actually getting all the numbers needed to sell it to management, but it’s something you want to have on hand to sell it.”

“Get all parties, all departments there from the beginning and get buy in from everyone.”

Finally, one participant cautioned future firms not to underestimate the resources necessary to undertake the program.

“You don’t want bite off more than you can chew... it’s a balance to put your time towards [the Kaizen Blitz] project and keeping the plant operating.”

Conclusions and Recommendations

Conclusions

All of the cohort one participants reported that they are maintaining the changes they made during their Kaizen Blitz participation and all participants are confident in their ability to sustain the savings they've achieved over the long term. Some have incorporated practices learned from the Kaizen Blitz into daily routines and maintenance procedures in order to ensure continued savings.

Participants are mainly motivated to undertake the Kaizen Blitz by the potential for energy and cost savings. Having an outside opinion and a better understanding of facility operations are also seen as highly valued benefits of participating.

The incentives were effective at reducing the return on investment to acceptable levels and motivating the participants to action.

Participants said that the energy information system is a useful tool for tracking energy use and savings, and all but one said that they have had a chance to use it personally. The majority of participants said that the system was easy to set up.

For cohort two participants, the level and frequency of use of the energy information system varied considerably across participants. Most participants responded that they use the tool monthly, weekly, and bi-weekly.

The Kaizen Blitz was considered a success by all participants and has made them more likely to undertake initiatives with Energy Trust in the future.

Cascade Energy's unique expertise and knowledge was highly valued by participants and instrumental to the success at the individual participant sites. Participants were particularly satisfied with Cascade's quick response-time to questions or concerns.

Actual barriers experienced during the Kaizen Blitz included time and labor constraints, especially internal labor constraints during peak business seasons. Other participant concerns included keeping staff organized internally and keeping track of Kaizen Blitz documents, costs, and labor hours.

Participants are applying techniques and action items from the Kaizen Blitz at their other facilities.

Participants said that the time frame was reasonable to complete action items, with some participants able to complete most items within three to six months.

Recommendations

Program information or presentations about the Kaizen Blitz should inform potential participants that their staff can expect to spend from 10 to 30 percent of their time implementing the Kaizen Blitz action items. This will establish realistic expectations with participants and ensure that those firms who enroll are well prepared for the engagement.

Cascade should work with participants to develop a process or tools to assist the participants with tracking regular maintenance labor versus Kaizen Blitz-eligible labor and other paperwork required to submit for their incentive.

The program should allow for follow-up support or mentoring ensuring that the changes made are maintained. At a minimum, Cascade should make regular follow up inquiries to offer assistance with any issues with the implementation of the action items or the e-manager tool.

Cascade should document participant best practices and resourceful solutions to issues and make this information available to participants.

Energy Trust or Cascade should consider commissioning enhancements to the energy information system, such as the ability to incorporate site production data, break out end uses, change report intervals, and present results graphically.